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HIGH-LEVEL MANPOWER DEVELOPMENT AND ECONOMIC GROWTH

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Human Resources and the Wealth of Nations

1. The wealth of a nation depends ultimately upon the productive skills and the levels of education of its people. And its rate of social and economic growth will be dependent in significant degree upon its rate of human capital formation. Thus, investment in the development of man should be a primary concern of every nation which hopes to make forward progress in the modern world. Progress, of course, is related to the general levels of education and skills of a country's entire population, but it is even more intimately connected with the development of its strategic or high-level manpower. This paper is concerned with the logic of high-level manpower development in relation to general social and economic growth.

2. Any definition of strategic or high-level manpower must be somewhat arbitrary. For the purposes of this paper, we shall assume that it includes all persons who have twelve or more years of formal education or its equivalent in skill and experience. Accordingly, in most countries this definition will encompass all professional personnel including scientists, doctors, engineers, architects, agricultural officers, veterinarians, lawyers, university professors, etc. It includes all senior administrators, executives, managers and principals of sizeable establishments in government, industry, commerce, transportation, etc., as well as political leaders, officers of police and armed forces, judges, and senior union officials. One definition also includes all subprofessional personnel in agriculture, industry, commerce and the public services, such as for example nurses, higher supervisory personnel, chief clerks, and technicians of all kinds. Highly skilled artisans and craftsmen are also included. Finally, we include teachers in secondary schools, technical institutes, teacher-training institutions, and vocational schools. In the more advanced countries, primary school teachers would also be classified as high-level manpower, but in most of the less developed countries their educational and skill level would generally be beneath the high-level manpower category.

3. Our arbitrary definition thus covers all of the leadership groups and their technical associates. It includes as well the upper echelons of teachers. It encompasses a country's ruling elite, but includes in addition many others. In short, it takes in all those persons possessing knowledge and skills which are critical for a country's development.

Strategic Human Capital as a Measure of Economic Advancement

4. The stock of high-level manpower possessed by a country is perhaps one of the best indicators of its stage of economic and social advancement. In the most advanced countries, for example, the number of persons with 12 years' education or its equivalent probably exceeds 100 per 1,000 population. In such countries, primary education for 8 years is both universal and compulsory. Well over 50 percent

of the 14-17 year age cohort is in secondary schools, and over 10 percent of the 18-20 cohort is enrolled in some form of higher education. In the more primitive underdeveloped countries, on the other hand, only one person per 1,000 population may have 12 or more years of education. In these countries, less than a third of the 7-13 year age cohort is in primary school; less than one percent of the 14-17 group is in secondary school; and only a handful of individuals are enrolled in higher education either at home or abroad. Between the less developed countries and the very advanced countries lie most of the less-advanced developed countries and the more-advanced underdeveloped countries of the world.

5. In general, the stage of a country's development as measured by these human resource indicators shows a positive correlation with its stage of development as measured by estimates of national income per capita.[1] However, the relative differences between some advanced and less developed countries may be greater in terms of high-level manpower than in terms of per cpaita national income. The table below, which is presented purely for illustrative purposes, shows this quite clearly:

Country	Number of persons per 1000 population with at least 12 years education	National income per capita (in U.S. Dollars)
Nigeria	.8	64
Egypt	10.7	110
Italy	31.4	594
U.S.S.R.	112.6	721
United States	288.0	2800

6. Italy, for example, has 39 times more persons per 1,000 population with 12 years or more education than Nigeria, but its national income per capita is only about 9 times that of Nigeria. Similarly, the U.S.S.R. has a per capita stock of high-level manpower 11 times greater than Egypt, but its national income per capita is only 7 times greater. On the other hand, relative differences in stock of high-level manpower and national income in the United States as compared with Egypt are about the same, while the comparison between the United States and the U.S.S.R. shows a greater relative difference in national income per capita than in stock of high-level manpower.

7. Because of the obvious technical difficulties in constructing accurate measures of the stock of high-level manpower and national income (which lie beyond the scope of this paper), one should be most cautious in relying too heavily on statistics such as those presented above. Nevertheless, they do give some indication of possible relationships between the development of high-level manpower and general economic development. And by using where available more refined qualitative and quantitative human resource development indicators, it is possible to make more precise and sophisticated distinctions between countries at various stages of progress.[2] The only point being stressed here, however, is simply the importance of

[1]The data presented here regarding the relationship between human resource development and general economic growth are taken from a study in progress by the author and his associates at Princeton University. This study is entitled "Models of Human Resource Development in Modernizing Societies."

[2]Some of the indicators are as follows: enrollment in educative institutions of different levels and types; numbers of professional personnel (doctors, engineers, scientists, etc.) per 1,000 population; university graduates per 1,000 population; dependence on non-native high-level manpower in senior positions in major public and private institutions; rates of population increase; and percentage distribution of the labor force in primary, secondary and tertiary industries.

using some measure or measures of human resource development when analyzing the problems and prospects of economic and social growth in newly developing countries.

High-Level Manpower Requirements and Economic Growth

8. On the basis of preliminary studies in 30 countries at various stages of development, it is possible to make some tentative generalizations regarding the relationship between high-level manpower and general economic development. Although these generalizations need to be refined, qualified and used with caution, they may serve as rough guide lines for policy planners. In brief they are as follows:

(a) In all developing economies the rate of accumulation of high-level manpower exceeds the rate of increase of the total labor force. In the United States, for example, the increase in high-level manpower during the past fifty years is certainly more than twice as great as the increase in the nation's labor force. This has been true also of the Soviet Union. And it is probable that most newly developing countries in their early stages of growth may have to increase high-level manpower at least three times as rapidly as the increase in their labor forces, if they are to achieve a rise in per capita income of 2 percent or more a year. Within the high-level manpower category, of course, certain critical occupational groups, such as, for example, engineers, technicians, agricultural experts and secondary school teachers may need to increase at a much more rapid rate, whereas lawyers and arts graduates should probably increase at a more moderate pace.

(b) In most countries, the rate of increase of high-level manpower--(or the rate of strategic human capital formation)--will also exceed the rate of economic growth. In newly developing countries which already have critical shortages of highly skilled persons, the ratio of the annual increase in high-level manpower to the annual increase in national income may need to be as high as three-to-one, or even higher in those cases where expatriates are to be replaced by the citizens of the developing country. In more advanced societies, which already have a sizeable stock of high-level manpower, this ratio may be considerably lower. Here again the ratios of increases of particular occupational groups within the high-level manpower category are even more significant than the ratio for the high-level manpower group in the aggregate.[3]

(c) Equally important as the rate of high-level manpower accumulation is the efficiency with which it is employed. In the newly developing countries in particular, high-level manpower may be poorly utilized because of a poor balance of skills in relation to needs. There may be too many lawyers, and too few engineers and technical foremen. Doctors may not be effectively utilized because of a shortage of nurses or medical technicians. In many countries fewer highly trained

[3]This hypothesis suggests that, on the basis of comparative research in a number of countries at different stages of growth and with different patterns of development, it might be possible to devise "multipliers" to estimate future requirements of strategic occupational groups in relation to projected growth patterns and growth rates for an economy. Such "multipliers," of course, would be particularly useful in planning investments in various kinds of education. In this way, the programming of investments in human resource development could be integrated effectively with planning for general economic growth. Admittedly, much empirical evidence would need to be accumulated to build reliable "multipliers" of this kind. And, if such "multipliers" are to be useful for policy planners, one would need to construct them for various categories of critical occupations. From a theoretical standpoint, however, the concept of "high-level manpower to growth ratios" is a useful tool of analysis, parallel in many respects to the marginal capital to output ratio in economic analysis.

engineers would be needed if there was a more adequate supply of engineering technicians. In nearly all newly developing countries, highly trained people may be employed on jobs beneath their skill merely because there is a more critical shortage of persons with lesser intermediate skills. Thus, as in the case of capital funds, the proper utilization or "investment" of high-level manpower may be as important as its rate of accumulation. Here the patterns of incentives which education generates, the types of persons produced, and the manner in which they become allocated to strategic activities are of supreme importance.

(d) The required rate of accumulation of high-level manpower in a developing society is related to change and innovation in economic, social and political life. A static society usually requires very few persons in the high-level manpower category. But as a static society begins to modernize, it must accumulate high-level manpower of all kinds to staff a new and expanding government service, to introduce new systems of land use and new methods in agriculture, to develop new means of communication to carry forward industrialization, and to build a system of education. Changes in all these fields require large inputs of persons with professional and technical skills and organizing ability. The more rapid the changes, the more intensive will be the use of high-level manpower.

The Accumulation of High-Level Manpower

9. Granted the strategic importance of high-level manpower for a country's economic advancement, how can it be accumulated? Or, to use the terms of the economist, what are the major processes of human capital formation in newly developing societies?

10. Obviously, high-level manpower may be developed through investment in formal education--i.e., in schools, technical training centers, colleges, universities and other institutions of higher education. But this kind of development takes a long time. For example, it takes 8 to 10 years to make a qualified engineer out of an 8 year primary school leaver. It takes even longer to train a good scientist or a competent doctor. Even nurses, secondary school teachers, and engineering or agricultural technicians require 4-6 years of training beyond the eight grade before they can be considered qualified. Indeed, in planning ahead a country must assume that its potential new additions to high-level manpower stock from domestic sources for at least 15 years in the future, are presently in school. Thus, no broadening of the base of primary education will have much effect upon the development of high-level manpower within that time-span. The rate of accumulation of high-level manpower within the 15 year period can be increased only through investment in education at higher levels of those who are already in school.

11. Fortunately, however, there are other ways of accumulating high-level manpower and accelerating the rate of its development. High-level manpower may be imported from abroad through a variety of means such as technical assistance, expatriate enterprises, hiring of consultants, or encouragement of immigration. It may be developed in employment through on-the-job training, in-service programs of education, management development seminars, part-time "sandwich" adult education classes, and many other means. High-level manpower may also be developed in employment through better organization of work, the creation of productive attitudes and incentives, and better management of people. And, of course, the development of people is assisted at all levels by improvements in public health and by better nutrition.

12. The task of the newly developing country, therefore, is to devise a logical strategy of high-level manpower development, and to relate this strategy to its broader objectives of economic growth. We shall conclude this paper with a brief listing of the elements of such a strategy and the measures which may be employed to implement it.

A Strategy of High-Level Manpower Development

13. A strategy of high-level manpower development has these essential components: the rational development of formal education; the promotion of effective training of employed manpower; the building of incentives which are appropriate for a productive society; and the temporary use of foreign personnel to fill positions requiring skills which are unavailable within the country. These four elements are interdependent. Progress in any one area is usually dependent upon coordinated progress in the other three as well.[4]

14. It is obvious that a strategy of high-level manpower development involves much more than a program for development of formal education. Indeed, investments in formal education are likely to contribute effectively to rapid growth only (a) if there are adequate incentives to encourage men and women to engage in the kinds of productive activities which are needed to accelerate the modernization process and (b) if appropriate measures are taken to shift a large part of the responsibility for training to the principal employing institutions whether they be public or private. A well-defined strategy of high-level manpower development therefore requires a sound program of wage and salary administration, a program for training-on-the-job, a program for the importation of critical skills, as well as a program for investment in formal education.

15. The program for developing formal education, however, is perhaps the most difficult and certainly the most costly element in the strategy. And, here countries with limited resources have some hard choices to make. In most of the newly developing countries, priority must be given to investment in and the development of broad secondary education, and in poor countries, this may require the temporary postponement of achievement of universal primary education. And, with regard to higher education, most of the newly developing countries may need to give priority to building of intermediate level training institutions and to expansion of the scientific and engineering faculties of universities. The country which is committed to rapid economic progress needs to make careful assessments of the future demand for various categories of high-level manpower, and to some extent it will have to shape its program of investment in education to meet this demand. For this reason, education policy should not be left exclusively in the hands of educators or education ministries. It must be influenced at strategic points by those who are concerned with the general problems of economic growth.

16. The analysis set forth above suggests that most newly developing countries might be well-advised to establish some kind of human resource strategy board to plan and coordinate the various programs which are necessary for the rapid accumulation of high-level manpower. Such a board should have broader responsibilities than a statistical agency, a study commission, or a long-range planning organization. Although primarily concerned with policy formulation, the human resource strategy board should be involved in day-to-day coordination of activities of various ministries and employing institutions. It thus would have both advisory and executive responsibilities. Its top staff, therefore, should be neither statisticians, professional educators, or economists as such. Rather its key personnel should be strategists--persons who combine political insight with a rational understanding of the processes of economic and social growth in this Century of Science.

[4]For a fuller description, Frederick Harbison, "Human Resources Development Planning in Modernizing Economies," International Labour Review, LXXXV, No. 5, May 1962.

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